ENVIRONMENTAL IMPACT STATEMENT

relative to

Flood Control Improvements

on

ALAMIAS CREEK

South Zone (S-1)

Project No. 50029

Santa Clara County Flood Control
and Water District

August 1972

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ENVIRONMENTAL IMPACT STATEMENT
for the
Alamias Creek
Flood Control Improvement Project

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INTRODUCTION

This statement is prepared in accordance with Section 21151 of Division 13 of the Public Resources Code and is intended to give appropriate consideration to the environmental impact of proposed construction of flood protection work on Alamias Creek. The statement was written by the Santa Clara County Flood Control and Water District staff in consultation with appropriate local and State agencies.

A. Project Description

Flood Control improvements are planned for the lower 9,700 feet of Alamias Creek, which is a part of the Llagas Creek Basin. The project location is within an unincorporated area of South Santa Clara County east of the City of Gilroy (see Plate 2 of Report on Proposed Improvements on Alamias Creek).

The Alamias Creek rises in the east foothills of South Santa Clara Valley with well defined channel sections in the hills. After the creek enters the relatively flat but gently sloping valley floor it looses identity and in the lower most area almost disappears as it approaches Llagas Creek. Within 1200 feet of Llagas Creek, Alamias Creek turns south and flows almost parallel to Llagas Creek for 4.5 miles before flowing into Llagas Creek at Bloomfield Road. This lower portion of the creek is known as Jones Creek and is not considered as part of this project because the project proposes the diversion of Alamias Creek into the Llagas Creek along Leavesley Road.

The proposed improvements consist of 5,600 feet of trapezoidal section rock-lined channel in the downstream reaches where there is presently no channel or where the channel has an inadequate flow capacity. This reach includes the diversion to Llagas Creek. The upper reach of the project, about 4,100 feet in length, is primarily a right-of-way reserve along the natural stream to permit maintenance of its flood carrying capacity and stability. In this reach the existing channel has adequate capacity to convey the design flood flows, but erosion prevention measures and maintenance work, and some selective clearing of undesirable vegetative growth may be necessary.

The proposed improvements, when constructed, will prevent major flooding of cultivated land in the floodplain area of Alamias Creek and Jones Creek and incidentally reduce possible erosion damages to the upper channel environment. A detailed description of the project is found in the report on proposed improvements on Alamias Creek to which this statement is appended.

B. Environmental Setting

Alamias Creek is located in the east foothills of Santa Clara Valley. It has a total watershed area of about 2,000 acres, of which 1,200 acres is hill land and 800 acres are on gently sloping valley floor. The crest of the hills is about elevation 1,600 and the base of the hills is about elevation 500.

The hill lands are characteristically grass woodlands with the predominant trees being scattered oak (live and white) and sycamore. There is a concentration of these trees along the upper reaches of Alamias Creek and its tributary channels. Along the creek channel in the valley, the vegetation includes a scattering of sycamores, willows, wild plum, pepperwood, black walnut and thick growth of grass and blackberry bushes.

The mean annual rainfall averages about 20 inches over the Alamias Creek watershed and almost all the measurable precipitation occurs in the seven months October through April. The small watershed and limited rainy season result in intermittent stream flows with sharp peaks reflecting the concentration of rainfall. The intermittent nature of the stream flow precludes any fish life, but may support some animal life that can find water elsewhere during the dry season.

The valley floor has been intensively developed agriculturally. The irrigated agriculture is orchard (apricots and prunes) and row crops of specialty vegetables.

The environment near the creek will be subject to substantial change resulting from a planned widening, with partial realignment, of Leavesley Road.

C. Environmental Impact of the Proposed Project

The Alamias Creek flood protection project calls for control of the lower 9,700 feet of the creek channel. Of this length, 4,100 feet will remain in its natural state with only some erosion protection measures and selective vegetation clearing as required. The lower 5,600 feet of the project will modify the existing (or in some places non-existing) creek by constructing a trapezoidal section, rock-lined channel. This construction is justified by, and takes account of, the modified conditions resulting from the contemplated changes in land use and in roadway layout. It will provide a desirable realignment of the stream channel along the proposed enlarged Leavesley Road right-of-way. Upstream of the Leavesley Road crossing, it will follow the existing channel. The project will afford flood protection for the adjacent areas which, whether to be used for residential development or left as cultivated land, will not be adversely affected by flood waters, debris and silt after project construction.

The proposed project leaves a substantial length of the existing channel in its natural setting where it is sufficient to carry the flood flows. The excavated trapezoidal section, rock-lined channel at the downstream end of the project, when carefully constructed and with some landscaping, will not be aesthetically unpleasant.

With the construction of Santa Clara Canal (a component of the proposed San Felipe Water Importation Project) along the easterly foothills, water could be released down minor creeks in the vicinity for groundwater recharge and irrigation. This possibility could make the Alamias Creek a live stream all year around.

The rocks required for the channel lining will have to be obtained from a quarry.

D. Adverse Environmental Impact that Cannot be Avoided

The trapezoidal section rock-lined reach is required to convey the flood flows generated on the uplands through the valley without causing flood or erosion damages. This is necessary because no sufficient conveyance means exist in its natural setting. The construction of this channel will eliminate some orchard trees and minor stream-bank or streambed vegetation. However, this impact of the man made channel can be mitigated by landscaping so that in a few years it could be an addition to the environment.

E. Mitigation Measures Proposed to Minimize the Impact

The proposed project will provide erosion prevention measures that will protect the existing environment in the upstream reaches against loss, while alterations in this area will be minimal. The downstream reaches will require greater modification, but the environmental impact will also be minimal, considering that the proposed rock-lined lower reach will bring change to an area that now is not in a natural setting. In addition, the proposed channel type can be made more aesthetically pleasant than other alternatives such as concrete or earth sections with gradebreak structures. Depressed maintenance roads and planted or landscaped sloped areas will enhance the appearance of the channel.

F. Alternatives to the Proposed Action

During the preparation of the Alamias Creek planning report, several alternatives were considered to provide flood protection to the area. These included concrete lined channel, channels with fabricated revetments and earth channel section with gradebreak (drop) structures. These alternatives were not selected because they would have either a more damaging effect on the aesthetics of the environment or a higher cost with no demonstrated environmental advantage.

The alternative of no action has also been considered. The effects of such a decision would be to maintain hazardous flooding conditions becoming even more damaging with the potential advent of residential development and road modernization.

Another alternative would be to keep the improved Alamias Creek flowing into Jones Creek instead of diverting it to Llagas Creek along Leavesley Road. However, this would necessitate costly improvements of the ill-defined and insufficient Jones Creek channel on a reach twice as long as the proposed diversion, and channel enlargement on Jones Creek further downstream.

G. The Relationship Between the Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity

The proposed Alamias Creek flood control plan is designed to assure that the stream functions to the benefit of the area. Providing protection against flood flows is an element in the process of changing land uses presently contemplated while at the same time not adverseley affecting, but enhancing any productive function that the land may support. By reserving the the land along the creek in public ownership, it is possible to maintain and protect from detrimental actions a natural or improved watercourse in the best interests of the community.

H. Irreversible Environmental Changes Which Would be Involved in the Proposed Action Should it be Implemented

From a resources standpoint, the project would develop no irreversible environmental changes.

I. Conclusions

The proposed flood control improvement project for Alamias Creek will have no irreversible detrimental environmental impact on the community. The adverse effects are minimal and strongly outweighed by the benefits to the protection of both the existing environment and the contemplated land uses against loss and damage. The reservation of the lands along the creek in public ownership provides for the protective needs and for the flexibility to consider other potential multi-purpose uses that will best serve the interests of the community.

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

REPORT
on
PROPOSED IMPROVEMENTS
ON
ALAMIAS CREEK

Zone S-1
Project Number 50029

August 1972

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER DISTRICT

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July 11, 1972

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Santa Clara County Flood
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5750 Almaden Expressway
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Gentlemen:

Transmitted herewith is the Engineers' Report on proposed improvements to Alamias Creek, Project Number 50029, from its proposed confluence with Llagas Creek to the foothills. This project is in Zone S-1 (South) of the Santa Clara County Flood Control and Water District.

This report describes the proposed flood prevention improvements consisting of rock-lined trapezoidal sections and natural creek sections along the existing creek and a short rock-lined trapezoidal section diversion channel, which would convey the Alamias Creek floods to Llagas Creek. These improvements extend from the Llagas Creek upstream over a 9,700 foot reach of Alamias Creek. The estimated cost of the proposed improvements is $670,000.

The proposed improvements, when constructed, will prevent major flooding in the floodplain areas of Alamias Creek and of the upper reach of Jones Creek. There are no adverse environmental effects created by the proposed project that are not more than offset by the environmental improvements created.

I concur in the project as proposed and recommend a public hearing to be held as a prerequisite to construction of the project.

Sincerely yours,

Donald K Currlin
General Manager

Enclosure

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Environmental Impact Statement

INTRODUCTION

Alamias Creek is located in the South Zone of the Santa Clara County Flood Control and Water District. It originates on the western slopes of the foothills east of Santa Clara Valley, about five miles northeast of the City of Gilroy in the general vicinity of Pigeon Point. It flows westward through Ruby Canyon then follows Leavesley Road, ultimately flowing in a southwest direction paralleling Llagas Creek where it is known as Jones Creek.

Flooding occurs along the entire course of Alamias and Jones Creeks after Alamias Creek crosses Leavesley-Ferguson Road just easterly of New Avenue. In the low, flat and frequently inundated area of the upper reaches of Jones Creek, the main source of flood flows is from Alamias Creek.

It is recommended that Alamias Creek be diverted through an open channel approximately parallel with Leavesley Road to outfall in Llagas Creek near Holsclaw Road, thus relieving the present flooding conditions along Jones Creek (plate 2). It is also proposed that the existing Alamias Creek channel be improved from the point of diversion to about 2,100 feet upstream of the Leavesley-Ferguson Road crossing and then be substantially left in its present natural condition where only minor maintenance-type work would be done. It is further proposed that the existing culvert at the Dryden Avenue crossing be replaced by a new and more appropriate structure. These recommendations consider the flood control improvements presently proposed by the Soil Conservation Service for the Llagas Creek channel under the Watershed Protection Act (PL 566).

The present report consists of:

1 - a general description of the watershed with a map (Plate 2) showing the location of the proposed improvements and diversion;

2 - a discussion of the proposed project together with plates showing plans, profiles, typical cross sections and right-of-way;

3 - an estimate of the cost of the proposed project and suggested means of financing this cost.

Appended to this report is an environmental impact statement in accordance with Section 21151 of Division 13 of the Public Resources Code.

DESCRIPTION OF THE WATERSHED

The Alamias Creek watershed is located in gradually sloping foothills and has a drainage area of about 2000 acres or 3.2 square miles. The average annual precipitation over the basin is about 20 inches. The portion of that watershed which is presently subject to flooding by flows from the upper reach is the relatively flat valley floor. This area is proposed for extensive residential development, but is presently devoted primarily to agriculture.

Plate 2 is a map showing the Alamias Creek watershed and illustrating the general topography of the area. The length of the main channel is about 3.5 miles. The watershed is of oblong L shape, averaging about 9000 feet in width in the upper reach to about 4000 feet in the lower reach.

The drainage basin is essentially composed of two areas, the upland and valley floor areas. The division between the two areas occurs along Dryden Avenue. There is a small private lake on a major south branch of Alamias Creek. Some distance before crossing Leavesley-Ferguson Road, Alamias Creek receives a small tributary from the north. Alamias Creek continues along Leavesley Road and then turns south where it is known as Jones Creek.

More than 30 percent of the flood flows which discharge into Jones Creek originate in the three square miles of the Alamias Creek watershed. These flows must be conveyed about 4.5 miles, through orchards and valuable land, to the southern reach of Llagas Creek at Bloomfield Avenue. The downstream 3/4 mile reach of the Jones Creek channel passes through a perennially flooded low area commonly designated as Frazier Lake. This poor drainage situation in the Jones Creek basin would be relieved of that part of flood flows which comes from the upper watershed by diverting Alamias Creek to Llagas Creek along Leavesley Road.

The upland area is hilly to mountainous and is underlain by older semi-consolidated to consolidated rocks. Ruby Canyon is formed in volcanic and older alluvial deposits while the remainder of the drainage basin is underlain by well-indurated sedimentary rocks. Stream gradients are generally steep and the stream has actively eroded the underlying rocks. The stream channel is consequently well developed, with adequate flow carrying capacity. The underlying rocks are essentially non-water bearing and absorb little water through the stream channel.

The valley floor area differs considerably from the upland area. Stream gradients are mild. Sediment eroded from the upland area and deposited in the valley floor forms a broad alluvial fan which merges with alluvial deposits from Llagas Creek. The channel becomes shallower and less defined with increasing distance from the foothills. Infiltration rates of stream flows are generally moderate to high with the highest rates occurring in the upper portion of the alluvial fan (west of Dryden Avenue). The depth to groundwater in the area varies from about 50 to 100 feet with the most shallow depths near Llagas Creek.

The nature of terrain is such that in most storms the water is more or less absorbed but during storms of high intensity or long duration, the saturation point is reached and heavy runoff occurs which causes major flooding.

The upland portion of the watershed has very little development at this time and this area will probably remain as open space with continued grassland use for the foreseeable future.

The valley floor portion below Dryden Avenue is now predominantly agricultural and used for the cultivation of orchards and row crops. Its potential for residential development is, however, recognized. This area will also be affected by a project of the Santa Clara County Public Works Department, calling for the widening and partial realignment of Leavesley-Ferguson Road, making it a major communication artery.

The watershed characteristics discussed in this Section, i.e., soil type, topography, present and future land use and residential development, transportation features, together with the general hydrology of the area, have been considered in the concept and the design criteria of the proposed flood control improvements described in this report.

DESIGN CRITERIA

The criteria used in the design of the Alamias Creek flood control improvements follow accepted engineering standards. Conservative values of the roughness coefficient (representing the friction along the channel banks and bottom) were used in the hydraulic design of the channels.

Alternative improvements were compared on an economic basis with due consideration for aesthetics. Estimated construction costs including engineering and inspection costs, right-of-way values, and the present worth of future maintenance costs were input into the comparison analysis.

Completed improvements will provide a level of protection to safely convey the one percent flood (the so-called 100-year recurrence interval flood) through the area. Design flows and upper confidence limits were computed using the results of a regional flood frequency hydrologic analysis. The multiple correlation analysis, based on recorded data from gaged watersheds, is utilized to determine at a given point the required flood flow values in accordance with tributary area, mean annual precipitation and basin shape. The resulting design flood flows are given in Table 1. The freeboard design discharge is used to ascertain the adequacy of the channel section.

TABLE 1

PEAK FLOWS FOR DESIGN FLOOD

REACH	STATION	WATERSHED AREA, ACRES	DESIGN FLOW, CFS	FREEBOARD DESIGN DISCHARGE(CFS)
I	0+00 to 17+00	2026	1050	1600
II-III	17+00 to 51+00	1934	950	1450
III-IV	51+00 to 97+00	1282	620	910

DESCRIPTION OF PROPOSED PROJECT

It was determined in the planning study that a diversion of flood flows from Alamias Creek watershed to Llagas Creek would provide the most economical project for the area by reducing the downstream flood flows which contribute to flooding in the Frazier Lake area, thus requiring fewer channel improvements and smaller channel sections for Jones Creek.

The proposed Alamias Creek diversion will originate 1,700 feet downstream of the Leavesley-Ferguson Road crossing and outfall into Llagas Creek after crossing Holsclaw Road.

The proposed diversion channel and the proposed improvements to the reaches between the point of diversion and Dryden Avenue extend over a total length of 9,700 feet. The project includes rock-lined channel sections, a reinforced concrete culvert at Holsclaw Road, Leavesley Road and Dryden Avenues as illustrated in plan and profile on the accompanying plates. A confluence structure is to be provided at the junction with Llagas Creek downstream of the Holsclaw Road culvert; its final design will conform with the alignment, profile and cross-section of the improved Llagas Creek channel. No structure is provided for the maintenance access road along the east bank of Llagas Creek as Holsclaw Road could be the link.

The origin of the project (Station 0+00) at the outfall of the Alamias Creek diversion is on the Llagas Creek center line as presently designed for the PL 566 project.

The structures considered necessary include a double box culvert 10 feet wide by 10 feet high, 40 feet long, with 50-foot upstream and downstream transitions for the Holsclaw Road crossing at Station 5+50; a 12 feet wide by 10 feet high, 80 feet long box culvert with 55-foot upstream and downstream transitions for the proposed Leavesley Road crossing at Station 33+60; and an 8 feet wide by 6 feet high, 40 feet long box culvert, for the Dryden Avenue crossing at Station 96+80.

The improved channel profile is on a mild slope of 0.004 from the origin to Station 17+00 and of 0.008 from Station 17+00 to Station 37+00, then on a subcritical slope of 0.010 between Stations 37+00 and 56+00. Upstream of Station 56+00 to Station 97+00, end of the project, the existing channel is capable of carrying the design flow within its banks without any improvements. Rock slope protection and some selective clearing of the otherwise generally undisturbed natural vegetation will be provided where necessary on a maintenance basis. The required right-of-way for maintenance purposes along the unimproved channel with the necessary setback at the top of each bank is shown on the plates but not included in the cost of the project. However, the project cost estimate includes provision for replacement of the Dryden Avenue culvert.

Should debris basins prove necessary to resolve future maintenance problems, their locations would probably be upstream of the improved channel reach and would be selected on the basis of additional topographical investigations. The costs of these units are not included in the cost of the project.

The improved rock-lined channel and diversion channel will be of trapezoidal cross section with a minimum bottom width and minimum total depth of 8 feet, side slopes of one vertical to two horizontal and variable lining thickness and height as required. A fifteen feet wide, depressed maintenance access road, is provided on each side of the rock-lined channel, with adjacent drainage ditch, a planted or landscaped sloped area, and 3-foot roundings at the top of the banks. The total width of right-of-way will be 104 feet to 108 feet for the improved channel and 115 feet for the existing channel as shown on the plates.

POSSIBLE MODIFICATION

Additional land may be acquired with slight changes in the alignment of the channel to have a small park and a green way with trails along the channel leading to the future Llagas Creek Park Chain, thus making it a pleasant area. This modification presents some desirable features from a public use standpoint. It should be considered in conjunction with other public needs and desires at the construction design stage.

DESIGNATED FLOODWAY MAPS

It is desirable as the next step in the project planning process to prepare designated floodway maps which show the rights-of-way required for future construction. These maps will be recorded with the County Recorder and all appropriate local agencies will be requested to consider these designated floodways in the establishment of flood plain zones in their areas.

CONSTRUCTION STAGING

It is often feasible to install improvements on a flood control facility in stages in order to coordinate with land use changes and also reduce capital outlay during any one fiscal year. However, on Alamias Creek, because the lower reach has no defined channel or outfall, the entire project should be constructed in one stage.

PROJECT COSTS AND FINANCING

Estimates of the cost of construction of the proposed flood control improvements to Alamias Creek were made using current prices. Right-of-way costs were estimated on assumed values prevailing for land and the fair market value for any existing improvements. These construction costs do not include costs of a debris basin which may be needed in the future, nor do they include right-of-way costs for the land to be reserved in the reach where the channel will be left natural. In addition, no costs for landscaping the channels is included.

A contingency item was estimated to account for the costs of engineering, construction inspection, advertising, legal fees, and other incidentals. The estimated costs are presented in Table 2.

TABLE 2

ESTIMATED COST OF PROJECT

Station Limits	Construction	Engineering & Contingencies	Right-of-Way	Total
0+00 to 17+00	$131,000	$ 46,000	$ 25,000	$202,000
17+00 to 37+00	169,000	58,000	30,000	257,000
37+00 to 56+00	133,000	47,000	25,000	205,000
56+00 to 97+00	4,000	2,000	-	6,000
Total	$437,000	$153,000	$ 80,000	$670,000

The current assessed valuation of the South Zone and the current tax rate will not provide an adequate source of funds to complete all South Zone projects in the next few years. A possible source of funds to finance all or a portion of the project costs would be the formation of local improvement districts. Another possible way could be to do the project as a small PL 566 Watershed Protection Project under the U.S. Department of Agriculture Watershed Management Program if the benefits under present land use conditions are sufficient. This alternative will be explored with the Soil Conservation Service.

CONCLUSIONS AND RECOMMENDATIONS

As a result of the investigation of Alamias Creek reported herein, it is concluded that:

1. The lower reach of Alamias Creek is inadequate to convey the flood flows and current flood damages will increase as the area urbanizes.

2. The existing channel from Station 56+00 upstream is adequate to prevent flood damage to the adjacent lands but is subject to erosion damage.

3. The most economical and desirable solution to the flood problem would be to construct a diversion of Alamias Creek to Llagas Creek southerly of Alamias Creek and to enlarge the existing creek channel where it is inadequate. The diversion and the enlarged channel would be rock-lined trapezoidal in section.

4. The estimated construction cost including contingencies and right-of-way is $670,000.

5. There is presently no adequate source of funds to build the project in the near future unless a special assessment district is organized.

Submitted by:

Rene Beccat
Associate Civil Engineer

Recommended:

John L. Richardson

John L. Richardson
Division Engineer

Approved:

Lloyd C. Fowler

Lloyd C. Fowler
Director of Engineering